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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,880	10/29/2001	Minfeng Xu	15MG5559-XUI	1809

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EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/682,880

Applicant(s)

XU ET AL.

Examiner

A. Dexter Tugbang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 November 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 8-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to First Office Action***

1. The applicant(s) response filed on 11/8/05 has been fully considered and made of record.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. The rejections below are hereby repeated below merely for the applicant(s) convenience.

### ***Election/Restriction***

3. Claims 8-17 continue to stand as being withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention/species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 6/10/04.

### ***Claim Rejections - 35 USC § 102***

4. Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Crozier et al 5,818,319.

Crozier discloses a method of designing a magnetic resonance imaging magnetic comprising: providing at least one correction coil positioned about an axial bore (see Figure 8); and using the correction coil to reduce lower order harmonics generated by the magnet to improve homogeneity of the magnetic field at selected volumes around the magnet (see at least blocks 40, 42 and 46 in Fig. 4 and col. 11, lines 29+).

Regarding Claim(s) 2, Crozier further suggests that the magnet can be a superconducting magnet (see col. 12, lines 60+).

Regarding Claim(s) 3 and 5, in Crozier anyone of the coils (shown in Fig. 8) can be read as a "shimming coil" since shimming occurs (see col. 10, lines 54+) and Crozier uses at least six, if not more than six, coils (see col. 13, lines 13-18).

Regarding Claim(s) 6, Crozier further teaches that the magnet has a longitudinal axis disposed to lie in a horizontal plane (as shown in Fig. 8).

***Claim Rejections - 35 USC § 103***

5. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crozier et al in view of Leue et al 4,680,547.

Crozier discloses the claimed method as relied upon above and further including a cylindrical imaging volume having a design peak-to-peak magnetic field. However, Crozier does not mention that the magnetic field has a design peak-to-peak magnetic field inhomogeneity of less than 10 parts per million with an imagining volume between 20 to 50 cm in diameter, or that the magnetic field strength is 0.5-3.0 Tesla.

Leue suggests that it would be desirable to have a magnetic field with a field strength of 1.5 Tesla and a design peak-to-peak magnetic field inhomogeneity of approximately 2 parts per million in an imaging volume of at least 5 cm in diameter, from an operational standpoint in an MRI device and to control the spatial linearity (see col. 7, lines 23-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Crozier by utilizing the magnetic field strength and

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design peak-to-peak magnetic field inhomogeneity taught by Leue, to positively achieve an operational MRI and control the spatial linearity.

With regards to the imaging volume being between 20 to 50 cm in diameter, this feature is considered to be an effective variable within the level of ordinary skill in the art of manufacturing MRI devices. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a range of 20 to 50 cm in diameter of the imaging volume of the magnetic field, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

#### ***Response to Arguments***

6. Applicant's arguments filed 11/8/04 have been fully considered but they are not persuasive.

In regards to the merits of Crozier et al, the applicant(s) do provide arguments against the prior art. However, the applicant(s) do not necessarily point out which limitations of the claims are deficient with respect to the prior art and the examiner believes that the applicant(s) are arguing that Crozier does not teach "using the correction coil...magnet" (lines 4-6 of Claim 1).

Noting the above limitations with which the examiner believes that the applicant(s) are arguing, the examiner most respectfully disagrees with the applicant(s) arguments for at least the following reasons.

First, in the design of the MRI magnet of Crozier, one of his purposes is to clearly reduce the lower order harmonics. Crozier points this out in several instances. For example in blocks

40, 42, and 46 of Figure 4, Crozier is looking for the smallest possible error inclusive of any lower order harmonics. At col. 10, lines 57-60, Crozier explicitly suggests that lower order harmonics can be nulled, i.e. minimized or lowered, through shimming. So the examiner's position is that the lower order harmonics are reduced.

Second, Crozier seeks coverage in Claim 17 of his patent for the use *both of the MRI magnet and correction coil (primary coil) together*, in the design of the MRI magnet to achieve the overall design and reduce the lower order harmonics. The examiner previously noted that Crozier's Figure 8 shows both the MRI magnet and more than one correction coil that is utilized to reduce lower order harmonics, not only from the design of the MRI magnet, but also during operation of the MRI magnet after the design is completed (see examples of various operations and uses of the MRI system at col. 1, lines 15+).

While it is true that Crozier utilizes two separate processes of shimming and annealing to reduce and control the lower order harmonics, the claims are very broad and do not exclude any type or any number of processes necessary to reduce the lower order harmonics. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. This application contains Claims 8-17 drawn to an invention nonelected with traverse in response filed on 6/10/04. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

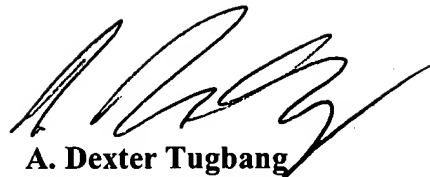
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570. The examiner can normally be reached on Monday - Friday 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**A. Dexter Tugbang**  
**Primary Examiner**  
**Art Unit 3729**

January 18, 2005